COMPUTER BASED MESSAGING IN A RESEARCH ORGANIZATION

by

Robert G. Rittenhouse

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Department of Information and Computer Science
University of California
Irvine, CA 92717

Abstract. Although transmission of messages by electronic means began over a century ago it is only recently that electronics, in the form of the computer, has been more than tangentially involved in message preparation and disposition. The use of a computer based message package by computer science research groups in one organization has changed the mail handling process and the work of those involved.

INTRODUCTION

Computer based messaging is a recent arrival on the communication scene. Its development is linked with the development of networks of interactive computer systems. These networks are only now moving out of the laboratory and into the corporate world. Hence there is as yet little empirical data on how computer based messaging is actually used. This paper reports on the use of computer based messaging in a computer science research organization and its effects on the jobs of research and secretarial staff. Data for this paper was derived from a series of interviews of system users at the site.

Uhlig (1) describes computer based messaging by using a "message data bank" metaphor. The sender enters messages into the data bank from a terminal and then instructs the system to "send" the message to an addressee or addressees. The message recipient is notified of message arrival when he next interacts with the system. He can then retrieve the message.

Extensions of this basic Computer Based Message Package (CBMP) aid in the creation and disposition of messages. One such extension is the ability to edit and modify the text of a message using word processing software. Other features involve using the CBMP as a database management system for the storage and retrieval of messages. The message recipient can discard a message, print it, save and retrieve it using several different filing schemes, annotate it, forward it, and process it in many other ways.

The use of the term Computer Based Message Package rather than the more common Electronic Mail System reflects two concerns. First: it is the inclusion of the computer in message handling that provides the CBMP with much of its power and differentiates it from telegrams, TWX, facsimile and other "electronic" mail systems (1). Second: Package reflects the fact that computers cannot be viewed as simple problem solving "tools" employable in a straightforward manner but must be seen as involving a "package" of hardware, software, skills, organizations, and beliefs about computing embedded in a complex social setting (2). The term Package is also intended to indicate that the machinery and people involved in computer messaging do not necessarily fit together as a smoothly working "system" but instead reflect a diverse "package" of entities that

have been adapted to, rather than designed for, their current use.

SITF

Computer Research Institute, or CRI (a pseudonym) engages in research in computer science for a number of governmental and nongovernmental agencies. CRI is also a major node on a computer network, and provides computer support for other network users.

The research staff is divided into full time researchers, typically Ph.D. holders in Computer Science or related fields; and part time researchers, graduate students from nearby universities. These researchers are organized into groups of six to twelve researchers under a project leader. Each group can call on secretarial support through the project leader's secretary.

Computer Research Institute is rich in computer resources. There are several computer systems available and few restrictions on computer use. Each researcher has one (or more) computer terminal(s) in his/her office. There are dial up lines available and many researchers have terminals at home or in other locations.

The Computer Based Message Package at this organization consists of a number of separate programs. Those commonly used include: ATTACH, a program that connects two terminals such that whatever is typed on one is echoed on both; SEND, a program to "deliver" messages to users of other computers attached to the network; NOTIFY, a program to announce the arrival of mail; and three mail handling programs to create and process messages. MAIL1 is an old program which lacks the features of some of the newer systems but is fast and has simple commands. MAIL2 is far more sophisticated but is slower and a heavy user of computer resources. MAIL3 is a new system similar to, but much faster than, MAIL2. Since all messages through the network are processed by SEND the three systems can send messages to and receive messages from each other but there are differences in message creation and archiving options.

Each researcher and secretary has a "mailbox" on the CBMP. Special purpose mailboxes include NOTICES, containing calendar facilities listing daily events, problem reports, policy notices and similar information; SUGGEST, used to send system programmers action requests such as enhancements and bug fixes; and a number of special purpose mailboxes used by persons interested in discussing particular topics.

USE OF CBMP

One of the major uses of CBMP at the research site is internal mail. According to the research staff and secretaries there is no conventional, paper internal mail system at CRI--the vast majority of intra-organizational written communication is via the CBMP. In addition much communication with other nodes on the computer network uses the CBMP.

To understand the effects of using the CBMP as a mail system it is necessary to understand the way in which it functions as one and the differences between it and conventional systems. Mail processing can be divided into four areas: creation (both composition and document preparation), delivery, distribution, and disposition (including acknowledging, archiving and retrieving messages). CBMP has caused changes for the research staff in all of these areas. To understand these changes requires looking at each area in some detail.

Creation. In conventional systems messages are typically drafted by one actor, the originator, and passed to a second actor, the secretary, for typing. Messages may be passed back and forth several times between originator and secretary for revision before the final version is produced.

At CRI, using the CBMP, this appears to be the exception rather than the normal mode of operation. In the words of one part time researcher: "It's more trouble to compose the message on a piece of paper, take it to a secretary and tell her where you want it to go and what you want it to do than it is to do it yourself".

The other researchers interviewed echoed these sentiments. Only when messages were easy to specify verbally or time consuming to format were secretaries used. In most cases researchers felt it was easier to create a message themselves than to delegate the task.

Delivery. Conventionally, messages outside the organization pass from the secretary to the mail room and thence to the USPS. Messages within the organization may be delivered by the secretary or by a messenger.

Messages on the CBMP are delivered effectively instantaneously within the organization and within three hours across the computer network. No human actor is involved in message delivery.

Distribution. Conventional messages are distributed by hand in one of two patterns: In Serial delivery a distribution list is attached to the message and recipients initial the list and pass the message down the list after reading. With Parallel

delivery the secretary makes multiple copies of the message and sends one to each recipient.

The CBMP distributes all messages in parallel. Distribution lists kept on the system are used and maintained by the MAIL handlers.

Conventional messages are delivered to fixed mailboxes ideally at or near the recipient's work station. CBMP messages are delivered to a "mailbox" associated with the user's computer account and can be accessed by the recipient from any terminal connectable to the system (either directly or through a dialup line).

Disposition. In conventional systems using serial delivery recipients acknowledge receipt of a message by initialling the distribution list. Acknowledgement may or may not occur in parallel delivery of internal mail. Conventional mail may be sent "Return Receipt Requested" but this is not the usual case.

With the CBMP used at this site receipt of messages is not automatically acknowledged. While all three MAIL processors include a "REPLY" command the equivalent of "Return Receipt Requested" does not exist (although some desire for it has been expressed).

Conventional messages are archived by being physically placed in filing cabinets by recipients or secretaries. Frequently one secretary maintains archival files for a department. To multiply file a document it must either be copied or a pointer to it filed. To retrieve an archived document the files must be physically searched. If a document is not found in an individual's file the central archive must be searched.

Messages on the CBMP are archived in computer files by the recipients. The only central archive at CRI is the system backup tapes. When documents are multiply filed the CBMP makes copies automatically. Retrieval is carried out by the MAIL processor the file was created by. Hence messages have to be refiled if either the filing system or the message handler is changed.

CBMP AND CHANGES IN WORK ROLES

CBMP use at CRI has shifted tasks involved in mail processing from secretaries to message originators and recipients and from secretaries and other actors to the CBMP. In particular the tasks of document production and archiving and retrieving messages have shifted from secretaries to research staff. In the words of one project leader "Electronic mail, like many other systems saves a lot of work for the secretary and gives it right back to me." It's important to stress that this task shift is a voluntary act on the part of originators/recipients, i.e. "It's

much faster to do it (message processing) myself."

The CBMP does more than redistribute work between message originator and secretary. The shifting of copy, delivery, distribution, and filing functions to the computer, and the use of tools such as text editors in the document preparation function imply a reduction in the overall amount of (human) work involved in message production. This result is in line with those reported in the literature. One study of CBMP use in an office environment estimated potential time savings of five to twenty-five percent of the principal user's time and fifteen to thirty-five percent of the secretary's time (3). Thus the redistribution of tasks does not appear to cause substantial extra work by message originators and recipients and may be perceived as reducing the labor involved in message processing by them.

There is one other important effect of the use of the CBMP on the work of researchers and secretaries at this site. Both groups claimed the CBMP allows CRI to function with a much smaller secretarial staff than would otherwise be possible (4). Two immediate consequences that members of both groups commented on are that secretaries at CRI serve more people than would be possible without the CBMP and secretaries see less of the communications of those they work for than would otherwise be the case. These two factors imply the possibility of real changes in the relationship between secretaries and those they work for where a CBMP is used as at CRI. To qualify this it must be noted that the computer science orientation and other factors involved in the makeup of this research site make it an atypical organization and further conclusions should be drawn with caution. The question seems deserving of further research.

REFERENCES

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2. Kling, Rob and Scacchi, Walt "Recurrent dilemmas of computer use in complex organizations" AFIPS--Conference Proceedings 48, 1979, 107-115.

3. Engel, G. H., Groppuso, J., Lowenstein, R. A., and Traub, W. G. "An office communications system" IBM Systems Journal, 18:3, 1979, 402-431.

4. Note: I do not wish to imply any causality here. I cannot claim that CBMP causes secretarial staff reduction or that a small secretarial staff is a factor in the success of CBMP.